

COMPUTERWORLD

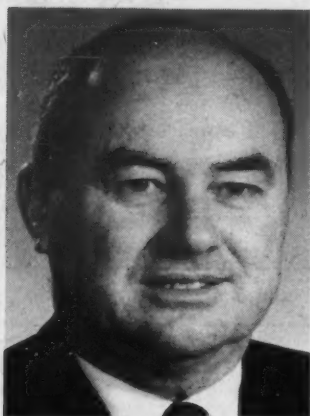
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper — Second-class postage paid at Boston, Mass.

Vol. 2, No. 17

April 24, 1968

Price: \$9/year



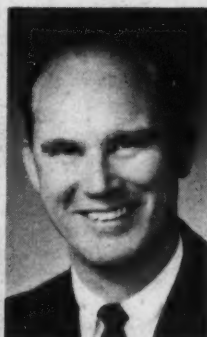
C.L. Davis



Benjamin Kessel



E.C. Lund



T. Paul Bothwell



C.W. Spangle

Honeywell Consolidates 3 Divisions Under New Group Executive Staff

MINNEAPOLIS — Honeywell has merged its two semi-autonomous computer divisions into a single group reporting to the company president. Formerly the Electronic Data Processing (EDP) and Computer Control (CCD) divisions reported separately to the board chairman.

Also included in the new Computer and Communications Group is the Communications Division.

C.W. Spangle will continue as vice president and general manager of the EDP Division.

Benjamin Kessel, formerly vice president of CCD, has been appointed to a staff position with Charles L. Davis, who has been named vice president of the new, three division group. Davis, a company director, formerly was vice president of the Aerospace and Defense Group.

T. Paul Bothwell, formerly CCD vice president of engineering, succeeds Kessel.

Edward C. Lund, formerly vice president and general manager of the Ordnance Division, has been named to the same position with the Communications Division.

James H. Binger, Honeywell board chairman, said the new group has been created "to capitalize on the opportunities to expand current computer activities and in recognition that these opportunities increasingly will involve communications and systems."

EDP at Wellesley Hills, Mass., with more than 3500 computers installed or on order throughout the world, will concentrate on expanding Honeywell's markets in all aspects of data processing and ancillary services, Binger said.

CCD at Framingham, Mass., with a line of computer products already established, will continue to develop markets for its computer systems for control, industrial process, and scientific use, he said.

The Communications Division will be responsible for the development, manufacture, and sale of communications equipment and systems for industry and government, Binger said. All of the company's communications hardware and systems activities within other divisions will be incorporated into the new division.

The new group will report to Honeywell President Stephen F. Keating.

In 1967, sales of computer systems and components and communications exceeded 20% of Honeywell's total sales of \$1 billion, Binger said.

In 3 Day Session

EDP Stocks Keep Moving Upward

In the three days of trading last week (the stock exchanges were closed Tuesday, the day of Martin Luther King's funeral, and Good Friday) stock prices continued to rise. CW's Computer Stock Composite Index rose 7.5%, compared with an increase of 4.6% in the Dow Jones industrial average, which stood at 906 on Friday's close. It is interesting to note, however, that the percentage gain by the stocks in the Dow Jones average was greater last week compared with the previous week, while the opposite was true of the computer stocks, in general. Some analysts feel that a further correction in the price of the "high-flyers" would not be surprising, as a slowing of their price spiral already appears to have occurred.

Stocks of computer manufacturers reflected this "slow down" in price increases. The sector index increased only 4.9% compared with 10.9% the previous week. SDS which had gained 27% in the previous week gained only 1% last week. While only one stock in the sector showed a decrease (Collins Radio was down 2% to 77-1/2) only one posted a gain of more than 10%. Scientific

(continued on page 7)

New Institute to Study Effects of Technology

NEW YORK — A nonprofit foundation dedicated to helping mankind deal with technological change has been established by automation pioneer John Diebold.

"Those concerned with bringing about the application of scientific and technological change should also concern themselves with the human and social implications of that change," said Diebold, chairman of the Diebold Group.

"Society's response to this problem to date has been inadequate and often superficial," he said.

Diebold said he founded the Diebold Institute for Public Policy Studies because he believed the private sector should more deeply concern itself rather than leaving these problems to government.

The institute's objective will be to identify the human issues raised, often inadvertently, by science; to raise questions concerning these issues; to produce a public awareness of the problems; to lead the way to necessary information; and to initiate action by key people and institutions.

Problem Areas

Some of the human problems to which Diebold feels the initial response has been inadequate include:

- Privacy: How to guide society to enjoy technological developments while still protecting individual freedom.
- Forecasting techniques and management decisions: Considerable investigation is needed of ways in which techniques can allow both more reasoned decisions of probable future considerations and anticipation of future problems.
- Artificial intelligence: What is involved when our tools not only increase man's intellectual capacities but actually rival and exceed them?
- Relationships among local governments: Exploration of the direct effects resulting from scientific and technological changes as they cross normal government jurisdictions and establish new relationships among jurisdictions.
- Control of behavior: The chemical

stimulation, retardation or selective control of learning involves the rights of individuals to move, work, speak, and think in an environment increasingly susceptible not only to centralized control but to imbalance as a result of individual actions.

Initial Programs

Among the institute's initial programs are:

- A lecture series at the Harvard Business School. Joseph C. Wilson, Xerox chairman, will be the first John Diebold lecturer April 23. Charles Thornton, Litton Industries chairman; James Webb, NASA administrator, and E.G. Woodroffe, vice chairman of Unilever Ltd., London, will lecture in the fall.
- Staff work has begun on ways in which private sector initiative can

help cope with a range of six public policy programs. Planning papers are being prepared as the basis for discussions with business and academic leaders in this country and Western Europe.

- The institute will publish a series of monographs, the first volume concerns the manner in which U.S. labor contracts have addressed the subject of technological change and assesses the effectiveness of the approaches.

Herbert J. Blitz, formerly research director for the Diebold Group, has been appointed institute secretary. The institute has offices at 430 Park Ave. here.

The institute is being financed by the Diebold Group, John Diebold, Inc., other corporations and individuals.

Service Bureaus File Court Brief Against Bank Selling Services

MINNEAPOLIS — Service bureaus have gone to the Federal Circuit Court of Appeal here in a continuing effort to have national banks barred from selling data processing services. A court hearing is expected to be held in May.

The Association of Data Processing Service Organizations (ADAPSO) and Data Systems Inc. of Minneapolis have asked the court to reverse a lower court dismissal of their suit against the federal comptroller of the currency and the American National Bank and Trust Company of St. Paul.

The federal district court dismissed the suit after the defendants argued that the plaintiffs lacked standing to bring such a complaint.

'Vending Illegal'

The new brief "will support the industry contention that it has sufficient interest in preventing the illegal vending of competing data processing services by national banks to justify judicial inquiry into the merits of the claim that such activities are illegal," said Jerome L. Dreyer, ADAPSO executive vice president.

The original suit was based on the charge that the bank's activities, and the ruling permitting them, were illegal under the National Banking Act, and that if allowed to continue, would cause "substantial and irreparable harm" to independent service bureaus whose sole business is to provide data processing services to the business public.

Injunction Sought

ADAPSO is challenging a 1966 ruling by the comptroller of the currency which allows national banks to perform data processing services for other banks and for bank customers. It specifically had sought an injunction to prevent the bank from providing the services.

A government spokesman said that the ruling was made because banks were acquiring expensive equipment which they were able to use only part time. Offering data processing services to other banks and customers was the only way to make the equipment profitable, he said.

IBM Net Earnings At \$3.33 per Share For First Quarter

ARMONK, N.Y. — For the three months ended March 31, 1968, worldwide consolidated net earnings of IBM were \$187,377,331 after taxes.

Earnings per share were \$3.33 on the 56,186,374 shares outstanding. This compares with net earnings after taxes in the same period last year of \$137,139,950, equivalent to \$2.45 per share on 55,880,599 shares, the number of shares outstanding March 31, 1967, adjusted for the 2-1/2% stock dividend paid June 10, 1967.

Net earnings before taxes were \$368,177,331 compared with \$273,239,950 last year.

Consolidated gross income for the three months amounted to \$1,480,769,642 compared with \$1,150,603,576 last year.

The report from Thomas J. Watson, Jr., board chairman, pointed out that IBM's business consists primarily of the rental and sale of data processing machines and systems. The increases in gross income and net earnings for the first quarter reflect the continuing high level of business volume of the System/360 data processing product line as well as a continuation of the increased level of outright sales of this equipment experienced during the last six months of 1967.

Editorials

Special Meanings

A problem with accuracy is that it is frequently meaningless unless people know the background thoroughly. An example, currently in the news as this editorial is written, involves the choice of a site for negotiations between the United States and North Vietnam. Many people feel that the arguments about the selection of the site are childish, not realizing that the term "secure" communications is really a reference to the computer and the electronic revolution.

To obtain "security" for negotiators in these days of electronic bugging is not easy. It is improbable that even in the security rooms of many of the United States' embassies can real security be obtained to the degree necessary for negotiators working out strategies. Anyone can realize the need for having "unbugged" conversations during negotiations — but although the word is completely implied in that little word "secure," many people do not realize it.

As people who understand the special requirements placed on diplomatic communication in the age of computerized cryptographic analysis, we have a special obligation to help the layman understand the technical meaning of words like "secure."

ACM & Apathy

There are few more pathetic sights than an association whose members — its grass roots — are apathetic. The front office can be virile, the committees active, the treasury bulging, but if the membership is not with you, the future is a choice between open or secret moribundity.

Regretfully we must record that our reporters have found — and continue to find — that the grass roots of the ACM are apathetic. Few members know or care about the elections. Fewer still seem to have positive feelings about the candidate of their choice (Richard Canning seems to be mentioned most, but more on the rather negative ground that he's not Bernard Galler than anything else).

Apathetic grass roots can result from many reasons. Perhaps the organization may not have a real reason for its existence. Perhaps the elections may not give the membership adequate control over the governing body. Perhaps the governing body may not, in fact, be actively governing. These are only some of the possible reasons.

However, whatever the reason, grass root apathy is dangerous; and COMPUTERWORLD hopes that someone will be successful in handling the situation within the ACM — and be successful soon!

COMPUTERWORLD

The Newsweekly for the Computer Community

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Patrick J. McGovern, Publisher. Alan Taylor, Editor in Chief. W. Walter Boyd, Managing Editor. Robert M. Patterson, News Editor. Neal Wilder, National Sales Manager. Henry Fling, Production Director. M. Phelan, Circulation Manager. Associate Editors: Joseph Hanlon, Kate Rachstein, Elly Tennenholts. Advertising Service Manager: R. Ziegler

Subscription rates are: \$9 for one year, \$16 for two years. Add \$1 per year for Canada; \$3 per year for Foreign. Please send all editorial and subscription material to: COMPUTERWORLD, 60 Austin St., Newton, Mass. 02160. (617) 332-5606.

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Faster Output

Printer Chain Characteristics Matched to Job Requirements

A considerably increased printing rate, using high speed chain printers, has been obtained by optimizing the design of the chain to the job that is to be printed.

The research included an examination of two specific printing operations, one with a cost accounting operation and one with an inventory system. Usage statistics were gathered for each of the jobs and an "optimum chain configuration" was determined for each. The tests were run on the IBM 1403 Model 2 printer and a 5000 line sample from each job was printed twice, once with the standard chain "each character on the chain five times," once with the corresponding optimum chain. Printing was done using single line spacing and the timing was made with a stop watch. The time showed that using an optimum chain could speed up the cost accounting by some 14% and the inventory accounting by 26.9%.

The main difference between the two character sets was that the inventory application was more highly numerical.

Method Used

To find out what the actual optimum chain arrangement should be for a specific program involves counting the use of the characters by average line, which is handled by a program available from the SHARE Library (SDA 3542). The approximate method can be seen in Figure 1, which shows the recommended number of times a character should be on the chain, related to how often it is used.

A character which appears 5 times on an average line should occur eight times on the optimum chain. If it occurs only three times per line, it should occur seven times. Actually, any character which can possibly occur has to occur at least once on the chain.

A chain can be optimized to a group of programs as well as a single program. Then the operating performance may apparently on occasion be slightly less optimum than the standard chain. Figure 2 shows the average printing speed for each of 22 applications using the standard chain and the chain optimized with usage statistics.

Oh — and when you have worked out your optimized chain — you can get it made up for you by IBM on special order, or alternatively you can use the data to select from the chains currently available.

Number of Times The Letter Occurs Per Average Line	Number of Times The Letter Should Be On The Optimum Chain
30 through 50	10
6 through 30	9
3 through 6	8
0.6 through 3	7
0.3 through 0.6	6
0.06 through 0.3	5
0.03 through 0.06	4
0.006 through 0.03	3
0.006 and under	2
	1

Fig. 1: Typical Optimum Chain Configuration

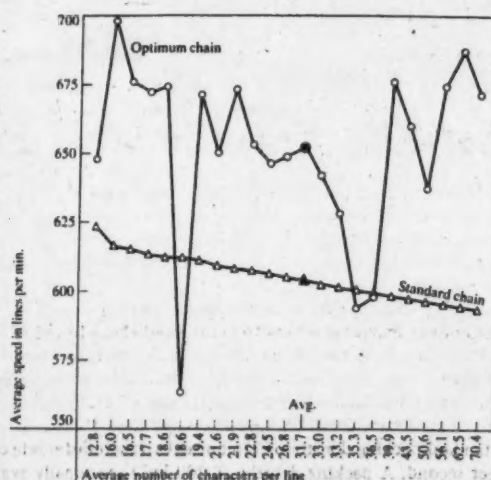


Fig. 2: Average printing speed for each of 22 applications using standard chain and chain optimized with composite usage statistics.

Letters to the Editor

Copyrighting Defended

To the Editor:

Your short news item (April 3) leaves the impression that Prof. Galler objected simply to our use of copyright to protect the integrity of our Trac T-64 on-line computer controlling language.

In fact, our policy statement (Rockford memos V-197, 202) to which he objects, embraces explicit standardization of Trac T-64 language by Rockford for the sake of widespread compatibility and suppression of dialects, brand identification for user protection by our Trac trademark, as well as sale and license of related goods and services so identified.

This new "Moore's Doctrine" of definite standardization by the source together with use of commercial trademark for the protection of the consumer public is, we believe, a constructive innovation which may be widely copied in software marketing. If it is, it may secure to proprietary software systems and languages some of the advantages long enjoyed by brand name hardware on the campuses and in the marketplace.

Calvin N. Mooers

President

Rockford Research Institute Inc.
Cambridge, Mass.

Navy Cobol Applauded

To the Editor:

Referring to your March 27, 1968 issue and specifically to the article "Navy has 30-minute test for any USASI Cobol Computer" I applaud the Navy for what appears to be a significant breakthrough in the state of our art.

One of the widely used reasons for the use of Cobol, and in fact its reason for being, is the ability to switch to a better mouse trap when invented at minimal cost. Yet, there are thousands of small installations like ours who just cannot afford to spend the time required to analyze the compilers of three or four manufacturers to ensure that we are writing in compatible Cobol. I believe the Navy could do our industry an infinite amount of good if they would release the results of these tests for each level of Cobol for each system produced by each manufacturer. Equally as beneficial would be the release of their standard Cobol Manual. Assuming the Navy or someone in the federal government must make these tests for their own use, the most logical disbursing agent would be the U.S. Government Printing Office, Washington, D.C.

Is the standard Cobol Manual available now and if so where can I obtain it and at what price?

I find Computerworld a most enjoyable newsweekly. The information is accurate, up to date, and brief.

Fred Kells-Murphy, CDP
Vice President, Operations
Applied Data Processing, Inc.
New Haven, Conn.

The Cobol manual is not presently available — only the Cobol test. The current target date for the manual is "Fall, 1968." Ed.

Measure for Measure

IBM 360/85

IBM has informed us that there is further material on the Model 85 which we have not yet had the opportunity to review. To enable us to make our examination of the claims made for the new IBM system as complete as possible, we have decided to withhold publication of the remaining articles on the system until after this new material has been received and reviewed. The first article was published last week.

ATS/360 Runs in Multiprogram Mode

WHITE PLAINS, N.Y. — IBM has added the Administrative Terminal System/360 (ATS/360) to the Disk Operating System, thus allowing people who are running under this system to add on-line publication and document revision facilities to their own system while continuing to use the computer for batch processing.

Previously ATS/360 required a dedicated computer. Now it can run in the foreground in a multiprogram mode so that other programs can continue in operation.

Serves Up to 60 Terminals

The new ATS works in a single partition of the DOS, and the IBM developers of the system recommend that it be in the first foreground partition, to improve the response time. The number of terminals which can be serviced is a function of the 2702 Control Units. Each 2702 can handle 15 terminals. Systems with a total of 60 terminals have been put into operation.

The cost of the system is \$4050 (or \$98 a month rental) per terminal plus \$39,500 (or \$875 a month) per control over and above the costs of the original computer system. No charge is made for the software itself.

Experience in computer programming is not necessary to use ATS/360. Secretaries, technical writers, clerks, and

executives can operate the system with only a few hours of instruction.

ATS/360 is an improved and easier to use version of a technique introduced by IBM three years ago. Since then it has been used by many aerospace firms, state and local government agencies, insurance companies, and by IBM. ATS/360 functions in a multiprogramming environment. This means that other jobs, such as payroll, inventory, or scientific computations, can be run on the computer at the same time it is handling material through ATS/360 terminals.

To use ATS/360, the operator enters his information directly into the computer from the keyboard of an IBM 2741 communications terminal. Since the system captures original source information, input methods such as card punching and optical scanning may be eliminated.

Full Control

Once the material is entered, the operator can store, correct, modify, or rearrange it at will. The information may be stored on magnetic disks and tapes, or on punched cards for further processing at a later time. To retrieve information, the operator types simple commands which tell the computer to print out the information.

When revisions are to be made, the operator only enters the changed words or sentences because the original information is already stored in the computer.

AST/360 is particularly useful in handling lengthy documents which must be updated periodically. Applications include technical manual preparation, file conversion maintenance, proposal writing, and the storage of manufacturing data and engineering specifications.

Data Protection

Protection safeguards built into the system can be employed by the user to limit access to restricted files of computer stored information. For example, the person who enters the material can assign a "lockword" — a group of random letters — to a stored document. Anyone who wants to access the protected information will have to type the lockword in its precise letter sequence before the computer will allow the information to be retrieved.

ATS/360 can be used with IBM System/360 Models 30, 40, and 50 under Disk Operating System/360 Release 15. It will be available later this year for larger models of System/360 under Operating System/360. Under OS/360, it may be used with as many as 15 other jobs running on the computer at the same time.

High Density Tape Drives Expand Satellite Capacity of H120, H125

WELLESLEY HILLS, MASS. — New 800 bits per inch tape drives, which expand the capability of small Honeywell computers to serve as satellites to larger systems, have been added to the product line by Honeywell's Electronic Data Processing Division. The two new tape drives operate at 19,200 characters per second.

Up to four drives can be used on either the H120 or H125 systems, and the full four drives, including the control unit, would lease from \$1430 a month.

Previously available for the 120 and 125 central processors are the 204B-11 and 204B-12 tape drives and their 103 control unit, which have a standard packing density of 556 bpi and a data transfer rate of 13,320 characters per second, and the 204B-15 and 204B-16 tape drives and their 103B control unit which have a standard packing density of 556 bpi and a data transfer rate of 26,700 characters per second. A packing density of 200 bpi is optionally available on all four of these tape drives.

Users of the new tape drives would be able to use the fastest units (26cps) on the H120 and 125 systems only with a different control unit. An installation which wants the additional tape speed and wants to be able to use 800 bpi tapes has to segregate the tape units accordingly or move upwards to a bigger (and more expensive) system.

First deliveries of the new tape drives and control unit will be made in June, 1968, or three months after an order is placed.

Service Bureau Opens in Canada

OTTAWA, ONT. — Canada has its first public computer service company. Called Computel Systems Ltd., the bureau is already serving five government agencies and a number of industrial concerns via telephone lines.

Computel is equipped with a \$2.5 million Univac 1108 system that includes a Fastrand mass storage capable of storing 132 million characters, three on-line Univac 1004 data terminals, and five communications sub-systems.

The company specializes in scientific

and statistical data processing and draws its name from the phrase "computer by telephone."

Currently the government users have 1004 data terminals supplied by Computel. Other customers, in Toronto and Montreal, are using their own 1004 card processors and dial telephone lines for communications with the computer.

Plans call for a tie-in system between the computer and conventional teletype units in the offices of the firm's customers.

Tape, Disk Units

DEC Selling Hardware to Users

MAYNARD, MASS. — Digital Equipment Corporation has entered the user hardware market, offering their tape units and disk drives to anyone prepared to integrate the equipment with their present computer. Company spokesmen say that many people have expressed a willingness to make such an effort to obtain the performance and convenience features of the DEC equipment.

One unit, a 33,000 cps tape unit which uses pocket sized reels and works in either direction, sells for \$2300. The other, a 65,000 character fixed head disk file which has an average access time of 17 milliseconds, sells for \$3000. Deliveries are being quoted at 90 days.

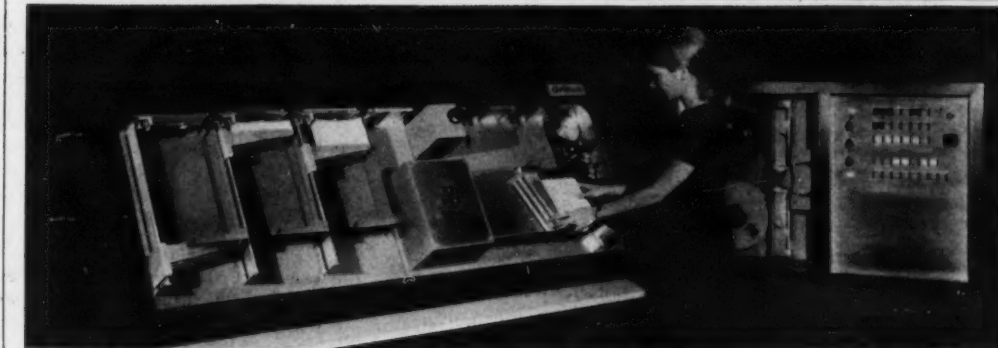
The company expects the change to

increase the use of peripherals it has developed for its own PDP systems. From the users' view, particularly those who have engineering talent available, it increases the flexibility of systems organization when considering special systems such as information systems.

Tape System Compatible With IBM, DEC

RYE, N.Y. — A self contained magnetic tape system claimed to be fully IBM compatible has been announced by Infotec, Inc. The TS-8 Magnetic Tape System can be obtained in either seven or nine track versions, and it can be used with either six or nine inch reels.

Packing densities of 200, 556, or 800



Hand written and printed documents are loaded into the optical scanner which reads them and transfers the data to magnetic tape for computer input operations.

Scanner Reads Hand Written, Printed Documents

NEWTOWN, PENNA. — An optical character scanning system that can read single line documents of up to 80 characters has just been introduced. The OpScan 288 reads both hand printed and machine printed characters and transfers the data to seven or nine channel magnetic tape. The scanner was developed here by Optical Scanning Corp. (OSC), Route 332 East.

The unit can read cards ranging in size from 2-1/2 x 3-1/2 inches to 4-1/2 x 8-1/2 inches and is compatible with all major computer systems.

The OpScan 288 can read two and three lines on each document, at reduced speeds. Single line documents are read at 600 per minute, two line documents at 300, and three line documents at 200.

Two Unit System

The OpScan 288 consists of two units. One transports, scans, and stacks the documents. The other contains the logic circuitry to transfer the data onto tape.

The system is free-standing and operates off-line. The basic price is \$98,088, monthly rental is \$1988. Rental is about equal to the salary and overhead cost of four keypunch operators.

The basic use of the OpScan 288 is in processing turn-around documents, such as those used by public utilities, department stores, credit card

companies, insurance firms, and book clubs.

Keypunching Eliminated

With firms that maintain billing or accounts receivable, the OpScan 288 and a turn-around form offer a money saving combination. The system reads the returned forms. Keypunching is eliminated.

With the OpScan 288, a clerk checks the documents for any needed additions or corrections. Then she simply uses a lead pencil to print the new information in a special grid on the document.

The OpScan 288 offers greater accuracy than keypunching. Up to eighteen characters and symbols make up the range of its reading capabilities. The unit can distinguish ten digits, six letters, and the signs for plus and minus. As many as 25 hand printed or 80 machine printed characters can be accommodated on a single scanning line.

Using the Grid

The key to the reader's ability to

interpret hand printed characters is an OSC designed grid. Preprinted on the document, the grid resembles a row of dominoes. A four dot configuration in each square serves as both constraint and guide, aiding the writer to print the characters in the proper areas of each square. OSC stresses that only firms willing to train people in correct writing methods should use documents with sections for hand printing.

The machine printed characters are in the American Standards Association ASA-A type font. Because machine printed characters are smaller and do not require a grid, up to 80 can be accommodated on a single line.

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Are CAI Funds Needed Elsewhere?

WELLESLEY HILLS, MASS. — Computer assisted instruction (CAI) programs and their gee-whiz gadgets are dangerously overshadowing more basic educational uses of computers, according to a computer market expert.

The cost of CAI runs anywhere from \$2 to \$4 per student per terminal hour, and the problems of creating instructional material have been very much greater than anticipated. It is not uncommon to spend 150 hours of manpower to create a good one hour of student terminal time, said Robert F. Trocchi, education marketing manager for Honeywell's Electronic Data Processing Division here.

"If as much money had been spent in the more practical areas of understanding the computer and less on the exotic audio-visual-student-terminal CAI experiments, there would be far more utilization of computers for instruction today," he said.

"More effort has to be expended in establishing computerized administration information systems before one can go into a practical environment of CAI," he said.

"How can we individualize instruction for individual student needs when we still have, in far too many

instances, archaic pupil personnel systems which are not identifying what these needs are?

"If a computer is being used simply to turn out report cards faster, to make it easier to turn out attendance reports, to make it easier to develop cumulative records and nothing is done to focus

education decisions on individual students as a result of this information, we have a long way to go on administrative systems before school administrators can focus their attention on CAI," he said.

It has been estimated that computerized instruction, if educationally and economically justified, could create a market in excess of \$1.5 billion a year for hardware alone, Trocchi said.

"Will we see a repeat of what happened to the 'teaching machine' a decade ago? Disillusionment with the teaching

machine, I feel in many cases, resulted from the lack of good material to 'stuff in the boxes' rather than the concept," he said.

New Techniques Needed

Computer capabilities should be focused on changing the technique of instruction, to open up new areas of investigation for students, to individualize learning, and not to simply speed up current techniques, he said.

Motion pictures, for example, permitted new instructional techniques which previously could not be obtained, he said.

The availability of computers for solving math and science problems and for simulation already has proved its worth, he said.

But CAI, the highest level of computer technology in aiding the instruction process, is in its infancy, he said.

Until technology has been able to interpret the results of experiments already conducted, "I feel it is time to take a breather on these many high cost experiments in CAI and to put the money where things have proven to be much more practical," he said.



Robert F. Trocchi



COMPUTERWORLD

education

Computing and Software Buys More Tech Schools

LOS ANGELES, CALIF. — Computing and Software, Inc. continues to expand its educational facilities throughout the United States and has added some engineering training to the present programming training.

With the recent acquisition of International Tabulating Institute in Washington, D.C. completed, President Norman E. Friedmann has announced the purchase of Solar Electronic Schools, Monrovia, Calif. with branches in Pasadena and Pomona.

"Acquisition of Solar Schools extends the scope of our educational curriculum," Friedmann said. "We now operate 18 education facilities throughout the United States and are in a position to offer students technical training in nearly every phase of the computer and electronic industries."

The Solar Schools, founded in Southern California some years ago, will continue under the direction of C.R. Corliss, current president of Solar. Similarly, in Washington, the International Tabulating Institute will continue under its director, C.J. Lotter.

General Trend?

The acquisitions continue the recent general trend to form educational units able to handle more than a single style of training. This has been evident in the expansion of the Control Data Institutes which include both hardware and software, and in the development of Computer Learning Corporation's courses which range from maintenance engineering to executive and salesman's courses.

3 Day Institute

Real Time Problems Study Set

NEW YORK — Actual application of basic concepts to such real time problems as system traffic, busy condition analysis, trade offs in message switching systems, and congestion will be studied intensively for three days next month. An "educational institute" devoted to analytical design methods for real time systems will be held at the Barbizon-Plaza Hotel here May 22-24. The instruction is intended for analysts and managers who are involved in software design, hardware design, and configuration selection for real time or for time shared systems.

Subject matter of the institute will be related to projects performed by the systems design division of Computer Applications Inc. (CAI). Material presented will include advances to the state of the art that have come out of CAI project work.

New Techniques Included

Techniques recently published by Harvey Dubner, vice president of CAI, and Dr Joseph Abate of the CAI

systems design division, will be covered by the institute. The problem of readily determining the inverse Laplace transform numerically by a method which is efficient enough for automatic digital computation was discussed by Dubner and Abate in the ACM Journal (January, 1968).

"Because the resultant inverse function is given as a Fourier cosine series," they wrote, "the procedure requires only about 10 Fortran statements. Furthermore, it does not require the use of involved algorithms for the generation of any special functions, but uses only cosines and exponentials."

Instructors will be Dubner, and three members of his systems design division — Abate, George Nestor, and consultant Sheldon Weinberg. Fee for the three day institute is \$315, which includes luncheons and materials. Additional information may be obtained from Dr Hanan Rubin, Director of Education and Training, Computer Applications Inc., 555 Madison Ave., New York, N.Y. 10022.

SSI Plans Seminar on Management and Computers

NEW YORK — The impact of computers on management will be examined June 12 at a seminar to be sponsored by Special Studies Institute at the Harvard Club here. Executives attending will learn how computers can be utilized, and how to bridge the gap between computer technology and the needs of management. General conclusions will be offered about advantages and limitations of computer applications.

Present computer applications by operational, middle, and top management will be reviewed. Feasibility studies will be discussed as a tool for management planning of electronic data processing. The relative merits of computer buy or lease decisions will be weighed. The impact of on-line, real time, and time sharing on management decisions will also be discussed.

Ten Subjects Covered

The one day seminar will be

The seminar will develop through ten major subject areas:

- | | |
|---|---|
| 1. Present computer applications by operational, middle, and top management | 6. The impact of on-line, real time, and time sharing on management decisions |
| 2. Feasibility studies as a tool for management planning of EDP | 7. The use of management and computer consultants |
| 3. Buy vs. lease computer decisions | 8. Computers and developing Operational Management Information systems |
| 4. Principle exceptions of computers | 9. Future expectations of hardware |
| 5. Impact of computers on top management decision making | 10. Future expectations of software |

conducted in the form of a dialogue between Dr Ernest Dale, management consultant, and Dr Nachman Bench, an authority on management sciences and computer applications. They will discuss use of management and computer consultants, as well as future expectations of hardware and

software. Ten major subject areas will be explored (see table).

Seminar information may be obtained from Leonard H. Aptman, Executive Director, Special Studies Institute, 122 East 42nd St., New York, N.Y. 10017.

PSI Plans 4 Day Seminar on Process Control Techniques

WOODLAND HILLS, CALIF. — The latest techniques used in the evaluation, design, and improvement of computerized production systems will be presented in New Jersey at a four day seminar developed by Programming Services, Inc. (PSI). The program is designed for data processing and engineering technicians from the paper, petrol, and pipeline industries and for people engaged in processing engineering, computer programming, and systems analysis.

The course will be held at the Ridgefield Park, N.J., facility of

University Computing Co. (UCC), April 22-25.

Process control systems will be defined and tasks of application team members explained. Problems will be identified and solutions proposed. Current practices will be outlined and the future of process control technology discussed. Panelists will include computer experts from PSI, UCC, and D.R. McCord & Associates.

Materials Provided

A book titled "Computer Control of Industrial Process" by E.S. Savas will be used. A syllabus on computer

systems for process control, a narrative outline of course content, and a list of readings in the process control field will also be covered by the \$345 registration fee. Luncheons will be provided at no extra charge.

Information about registration may be obtained from Registrar, University Computing Co., 1949 North Stemmons Freeway, Dallas, Texas 75207. Information about course content is available from vice president Wayne Aamoth, Programming Services, Inc., 6355 Topanga Canyon Blvd., Woodland Hills, Calif. 91364.

Computer Services Institute Appoints 3 Directors

EL SEGUNDO, CALIF. — In one of three new appointments, Arthur G. Trudeau, Jr has been named director of plans and programs for Computer Sciences Institute (CSI), an education and research service of Computer Sciences Corp. here. Trudeau was with IBM from 1955 to 1965 in various marketing communications assignments.

The other appointments were George B. Potter as director of educational systems and H. Warren White as director of CSI education and systems development.

Potter, previously director of the Aerospace Institute, University of Southern California, for seven years, will supervise the faculty's presentation of courses and education

programs in information technology. He also will be responsible for the design of computer based instruction systems.

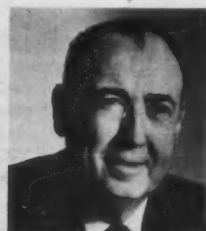
White, who spent 20 years with Lockheed Aircraft Corp. in various data processing positions, will be responsible for development of education systems for executive, management and technical levels, including preparation of text and audio-visual material.

Burgess Appointed

FALLS CHURCH, VA. — John Burgess, formerly with Control Data, has been appointed manager of technical development by Computer Learning Corp., a new firm specializing in educational programs for new and experienced people in the computer field.



George B. Potter



H. Warren White



Arthur G. Trudeau, Jr

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MONICA JUST
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ANDREA KARLSEN
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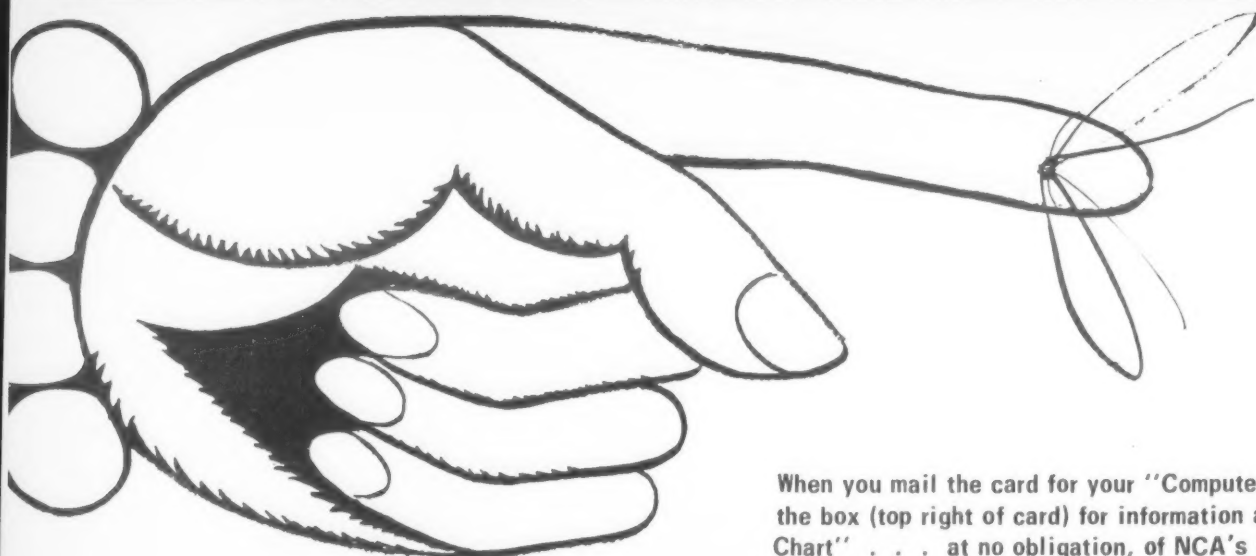
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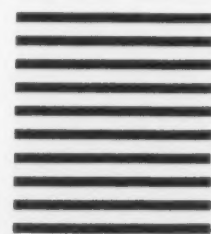
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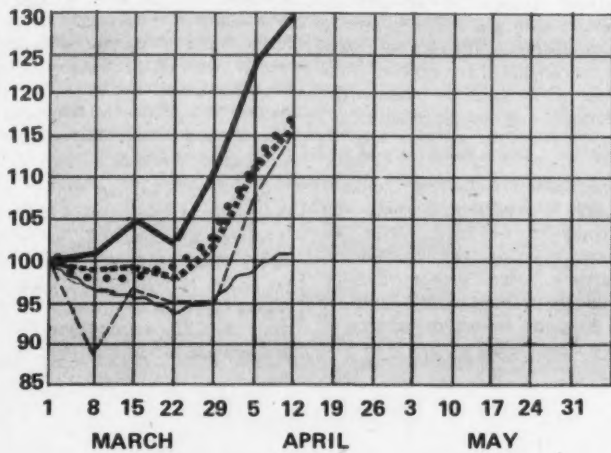




COMPUTERWORLD financial

Computer Stocks Trading Index

———— Computer Systems
 Peripherals & Subsystems
 ~~~~~ Supplies & Accessories  
 - - - - Software & EDP Services  
 ..... Leasing Companies



## EDP Issues Rise At Slower Pace

(continued from page 1)

Controls gained 14%, to 36. Burroughs, Control Data, RCA, Raytheon, and Sperry Rand each gained 6% during the week.

Again, only one stock in the Peripherals and Subsystems sector showed a substantial percentage gain. Rixon Electronics stood at 19-3/4 on Friday, up 28%. Alphameric continued its upward move, having gained 9% last week, to 98. The stock has gained 53% since March 1. The company, a manufacturer of high speed computer oriented photocomposition systems, recently filed \$625,000 of 6-1/2% convertible debentures due 1976, and 37,993 common shares. Bunker-Ramo and Milgo continued their downward slide. The latter was down 6% to 16-3/8.

Memorex showed the best performance in the Supplies and Accessories sector. The company's stock was up 14% to 63. Its Board of Directors recently requested that the stock be listed on the New York Stock Exchange. Memorex's sales volume (currently from sales of magnetic tape, disk packs, and peripheral equipment) has increased tenfold in five years, reaching \$34 million in 1967. Acme-Visible gained 9%, up to 50. Standard Register continued its decline, but was down only 1% during the past week. It is 25% lower than the March 1 base price. Adams-Millis continued its gains — up 7% over last week and 20% from the base price.

Every stock in the Software & EDP Services sector moved up last week, with several posting rather substantial gains. Brandon Applied Systems moved up 19% to 10-3/4; Electronic Computer Programming Institute was up 18% to 43-1/2; National Computer Analysts moved up 21% to 11-1/2; and Digitek and Planning Research were both up 11%. The smallest percentage increase in the sector was made by University Computing, which had shown a large increase (22%) the previous week. It was up 1% last week.

Leasco posted the largest increase among the leasing companies, continuing its upward movement. It gained 14% last week and 15% the previous week. Both Levin-Townsend and U.S. Leasing gained 13% during the week. Three companies remained unchanged: Cyber-Tronics, Dearborn Computer, and Management Assistance. Dearborn had been the biggest gainer among computer stocks in the previous week. Profit taking also caused the price of Datronic Rental to plunge 10%, the largest loss on the table this week, after the stock had risen 27% the previous week.

### Financial Items

DALLAS — DPA, Inc., a lessor computers and other data processing equipment, has acquired a 37% interest in Geotech, Inc., Salt Lake City, Utah, as well as options to substantially increase its holdings in the company.

Geotech is engaged primarily in the development of computer software for the petroleum, mineral, and mining industries. The company also sells time on its DEC PDP-10/50 time-sharing computer.

Last week DPA announced a proposed merger with Pioneer Texas Corp., Dallas. Pioneer's subsidiaries

are involved in distribution of lubricants and the manufacture of school book covers.

REDWOOD CITY, CALIF. — Ampex Corp. has received a contract for more than \$750,000 from Systems Engineering Laboratories, Inc., Fort Lauderdale, Florida, for magnetic core memory stacks to be used in various data processing systems built by the Florida firm. Delivery has begun and will continue through the fall.

Since 1962 Ampex has supplied a full line of single capstan tape drives to SEL.

## COMPUTER STOCKS: TRADING SUMMARY

Week Ending April 12, 1968

| EXCHANGE | BASE PRICE<br>3-1-68 | WEEK AGO<br>CLOSING<br>PRICE | CLOSING<br>PRICE | COMPUTER SYSTEMS          | WEEK NET<br>CHANGE | WEEK %<br>CHANGE | % CHANGE<br>FROM BASE |
|----------|----------------------|------------------------------|------------------|---------------------------|--------------------|------------------|-----------------------|
| NYSE     | 163 3/8              | 194 1/4                      | 205 1/2          | Burroughs                 | + 11 1/4           | + 5.79           | + 25.78               |
| NYSE     | 67 3/4               | 78                           | 77 1/2           | Collins Radio             | - 1/2              | - 1.64           | + 15.39               |
| NYSE     | 101 1/2              | 139 1/4                      | 148              | Control Data              | + 8 3/4            | + 6.28           | + 45.81               |
| AMSE     | 102                  | 132 5/8                      | 138              | Digital Equipment         | + 5 3/8            | + 4.05           | + 35.29               |
| NYSE     | 87 1/4               | 89 1/4                       | 92 5/8           | General Electric          | + 3 3/8            | + 3.78           | + 6.16                |
| NYSE     | 60                   | 73                           | 74 7/8           | Hewlett-Packard           | + 1 7/8            | + 2.57           | + 24.79               |
| NYSE     | 93 1/8               | 155 3/8                      | 118 3/8          | Honeywell                 | + 3                | + 2.60           | + 27.11               |
| NYSE     | 577                  | 630                          | 649              | IBM                       | + 19               | + 3.02           | + 12.48               |
| NYSE     | 103 7/8              | 124 1/2                      | 128 1/4          | Nat Cash Register         | + 3 5/8            | + 3.01           | + 23.47               |
| NYSE     | 78 1/4               | 50 1/8                       | 53               | RCA                       | + 2 7/8            | + 5.74           | + 13.07               |
| NYSE     | 46 7/8               | 87                           | 92 5/8           | Raytheon                  | + 5 5/8            | + 6.47           | + 18.37               |
| *OTC     | 22 1/2               | 31 1/2                       | 36               | Scientific Controls Corp. | + 4 1/2            | + 14.29          | + 60.00               |
| NYSE     | 118 1/8              | 154 1/2                      | 155 7/8          | Scientific Data           | + 1 3/8            | + 0.89           | + 31.75               |
| NYSE     | 45                   | 52 1/8                       | 55 1/4           | Sperry Rand               | + 3 1/8            | + 6.00           | + 22.78               |
| *OTC     | 45                   | 26                           | 26 1/2           | Systems Engineering Labs. | + 1/2              | + 1.92           | + 17.78               |

| EXCHANGE | BASE PRICE<br>3-1-68 | WEEK AGO<br>CLOSING<br>PRICE | CLOSING<br>PRICE | PERIPHERALS & SUBSYSTEMS    | WEEK NET<br>CHANGE | WEEK %<br>CHANGE | % CHANGE<br>FROM BASE |
|----------|----------------------|------------------------------|------------------|-----------------------------|--------------------|------------------|-----------------------|
| NYSE     | 58 3/8               | 60 1/2                       | 63               | Addressograph-Multigraph    | + 2 1/2            | + 4.13           | + 7.92                |
| OTC      | 64                   | 90                           | 98               | Alphanumeric                | + 8                | + 8.89           | + 53.13               |
| NYSE     | 29                   | 31 1/4                       | 31 1/8           | Ampex                       | - 1/8              | - 0.40           | + 7.33                |
| OTC      | 17 1/4               | 20                           | 20               | Bolt Beranek & Newman, Inc. | -                  | -                | + 15.94               |
| AMSE     | 13 1/2               | 12 3/8                       | 12 1/8           | Bunker-Ramo                 | - 1/4              | - 2.02           | - 10.19               |
| AMSE     | 32 1/8               | 38 1/2                       | 42               | Calcomp                     | + 3 1/2            | + 9.09           | + 30.74               |
| OTC      | 15 1/4               | 16 3/4                       | 17 1/2           | Data Products               | + 3/4              | + 4.48           | + 14.75               |
| OTC      | 19 1/4               | 21                           | 22               | Digatronics                 | + 1                | + 4.76           | + 14.29               |
| OTC      | 39                   | 41 1/2                       | 42 3/4           | Electronic Memories         | + 1 1/4            | + 3.01           | + 9.62                |
| OTC      | 10                   | 9 1/2                        | 9 5/8            | Fabtek                      | + 1/8              | + 1.32           | - 3.75                |
| OTC      | 34                   | 44                           | 45               | Gerber Scientific           | + 1                | + 2.27           | + 32.35               |
| AMSE     | 16 7/8               | 17 3/8                       | 16 3/8           | Milgo Electronics           | - 1                | - 5.75           | - 2.96                |
| AMSE     | 115 1/8              | 156 1/2                      | 166              | Mohawk Data Sciences        | + 9 1/2            | + 6.07           | + 44.19               |
| OTC      | 74                   | 90                           | 94               | Optical Scanning Corp.      | + 4                | + 4.44           | + 27.03               |
| OTC      | 72                   | 83 1/2                       | 85               | Photon                      | + 1 1/2            | + 1.80           | + 18.06               |
| AMSE     | 25 5/8               | 26 5/8                       | 27 1/2           | Potter Instrument           | + 7/8              | + 3.29           | + 7.32                |
| OTC      | 40 1/4               | 49 3/4                       | 52 1/4           | Recognition Equipment Corp. | + 2 1/2            | + 5.03           | + 29.81               |
| AMSE     | 16                   | 15 3/8                       | 19 3/4           | Rixon Electronics           | + 4 3/8            | + 28.46          | + 23.44               |
| NYSE     | 46 1/8               | 47 1/8                       | 47 1/2           | Sanders                     | + 3/8              | + 0.80           | + 2.98                |
| OTC      | 40 1/2               | 40                           | 39 1/2           | Tally Corp                  | - 1/2              | - 1.25           | - 2.47                |
| NYSE     | 242 1/4              | 263                          | 273 1/2          | Xerox                       | + 10 1/2           | + 3.99           | + 12.90               |

| EXCHANGE | BASE PRICE<br>3-1-68 | WEEK AGO<br>CLOSING<br>PRICE | CLOSING<br>PRICE | SUPPLIES & ACCESSORIES   | WEEK NET<br>CHANGE | WEEK %<br>CHANGE | % CHANGE<br>FROM BASE |
|----------|----------------------|------------------------------|------------------|--------------------------|--------------------|------------------|-----------------------|
| OTC      | 48 1/2               | 46                           | 50               | Acme Visible             | + 4                | + 8.70           | + 3.09                |
| NYSE     | 41                   | 46 1/4                       | 49 3/8           | Adams-Millis             | + 3 1/8            | + 6.76           | + 20.43               |
| OTC      | 13 5/8               | 13 3/8                       | 13 3/4           | Baltimore Business Forms | + 3/8              | + 2.80           | + 0.92                |
| AMSE     | 27                   | 29 3/8                       | 30               | Barry Wright             | + 5/8              | + 2.13           | + 11.11               |
| OTC      | 27 1/4               | 28                           | 28               | Ennis Business Forms     | -                  | -                | + 2.75                |
| NYSE     | 84 1/8               | 89 3/4                       | 92               | JM Company               | + 2 1/4            | + 2.51           | + 9.36                |
| OTC      | 58                   | 55 1/4                       | 63               | Memorex                  | + 7 3/4            | + 14.03          | + 8.62                |
| TOR      | 27 1/4               | 29 1/4                       | 31               | Moore Business Forms     | + 3/4              | + 5.98           | + 13.76               |
| NYSE     | 57 1/4               | 60 3/4                       | 61 1/4           | Nashua Corp.             | + 3/2              | + 0.82           | + 6.99                |
| OTC      | 31 1/4               | 30 1/2                       | 30               | Reynolds & Reynolds      | - 1/4              | - 1.64           | - 4.00                |
| OTC      | 34 1/2               | 26 1/4                       | 26               | Standard Register        | - 1/4              | - 0.95           | - 24.64               |
| NYSE     | 37 3/4               | 34 3/4                       | 35 1/4           | Unico                    | + 1/2              | + 1.44           | - 6.62                |
| AMSE     | 14 1/4               | 14 1/4                       | 14 7/8           | Wabash Magnetics         | + 5/8              | + 4.39           | + 4.39                |
| OTC      | 25 3/4               | 25 1/2                       | 26 1/2           | Wallace Business Forms   | + 1                | + 3.92           | + 2.91                |

| EXCHANGE | BASE PRICE<br>3-1-68 | WEEK AGO<br>CLOSING<br>PRICE | CLOSING<br>PRICE | SOFTWARE & EDP SERVICES         | WEEK NET<br>CHANGE | WEEK %<br>CHANGE | % CHANGE<br>FROM BASE |
|----------|----------------------|------------------------------|------------------|---------------------------------|--------------------|------------------|-----------------------|
| OTC      | 17                   | 16 1/2                       | 17               | Applied Data Research           | + 1/2              | + 3.03           | -                     |
| OTC      | 15 1/2               | 20 1/2                       | 21               | Aries                           | + 1/2              | + 2.44           | + 35.48               |
| AMSE     | 47                   | 51 7/8                       | 55               | Automatic Data Processing       | + 3 1/8            | + 6.02           | + 17.02               |
| OTC      | 9                    | 9                            | 10 3/4           | Brandon Applied Systems         | + 1 3/4            | + 19.44          | + 19.44               |
| AMSE     | 22 7/8               | 27 1/8                       | 27 5/8           | Computer Applications           | + 1/2              | + 1.84           | + 20.77               |
| OTC      | 30                   | 33                           | 35               | Computer Network                | + 2                | + 6.06           | + 16.67               |
| AMSE     | 40                   | 42 5/8                       | 46               | Computer Sciences               | + 3 3/8            | + 7.92           | + 15.00               |
| OTC      | 39                   | 43 1/2                       | 45               | Computer Usage                  | + 1 1/2            | + 3.45           | + 15.38               |
| OTC      | 36 1/2               | 45 1/4                       | 46 1/8           | Computing and Software          | + 7/8              | + 1.93           | + 26.37               |
| OTC      | 12 1/2               | 10 3/4                       | 12               | Digitek                         | + 1 1/4            | + 11.63          | - 4.00                |
| AMSE     | 38 3/8               | 36 7/8                       | 43 1/2           | Electronic Computer Prog. Inst. | + 6 5/8            | + 17.97          | + 13.36               |
| OTC      | 35                   | 40 1/2                       | 43 1/2           | Informatics                     | + 3                | + 7.41           | + 24.29               |
| OTC      | 11 1/2               | 9 1/2                        | 11 1/2           | National Computer Analysts      | + 2                | + 21.05          | -                     |
| AMSE     | 31                   | 34 1/4                       | 38 1/4           | Planning Research               | + 4                | + 11.68          | + 23.39               |
| OTC      | 9                    | 8                            | 8 1/8            | Software Systems                | + 1/8              | + 1.56           | - 9.72                |
| OTC      | 20 1/2               | 19                           | 19 1/2           | TBS Computing Centers, Inc.     | + 1/2              | + 2.63           | - 4.88                |
| OTC      | 63                   | 78                           | 79               | University Computing            | + 1                | + 1.28           | + 25.40               |

| EXCHANGE | BASE PRICE<br>3-1-68 | WEEK AGO<br>CLOSING<br>PRICE | CLOSING<br>PRICE | LEASING COMPANIES              | WEEK NET<br>CHANGE | WEEK %<br>CHANGE | % CHANGE<br>FROM BASE |
|----------|----------------------|------------------------------|------------------|--------------------------------|--------------------|------------------|-----------------------|
| OTC      | 19 1/4               | 21 1/2                       | 22               | Chandler Leasing               | + 1/2              | + 2.33           | + 14.29               |
| AMSE     | 25 1/8               | 28 1/8                       | 29 3/8           | Computer Leasing               | + 1 1/4            | + 4.44           | + 16.92               |
| OTC      | 12 1/4               | 118                          | 12 1/2           | Cyber-Tronics                  | -                  | -                | + 2.04                |
| AMSE     | 106 5/8              | 13                           | 115 1/8          | Data Proc. Financial & General | - 2 7/8            | - 2.44           | + 7.97                |
| OTC      | 12 1/2               | 24                           | 11 3/4           | Datronic Rental                | - 1 1/4            | - 9.62           | - 6.00                |
| OTC      | 20                   | 14 1/4                       | 24               | Dearborn Computer              | -                  | -                | + 20.00               |
| OTC      | 13 1/4               | 34 1/8                       | 13 3/4           | DPA, Inc.                      | - 1/2              | - 3.51           | + 3.77                |
| AMSE     | 28 3/4               | 116 3/4                      | 37 1/2           | GC Computer Corp.              | + 3 3/8            | + 9.89           | + 30.43               |
| AMSE     | 98                   | 59 3/4                       | 132 3/4          | Leasco                         | + 36               | + 13.70          | + 35.45               |
| AMSE     | 45 7/8               | 18                           | 47 5/8           | Levin-Townsend Computer Corp.  | + 7 7/8            | + 13.18          | + 47.41               |
| OTC      | 10 1/2               | 10 1/2                       | 10 1/2           | LMC Data, Inc.                 | + 1/2              | + 5.00           | -                     |
| OTC      | 10 7/8               | 10 1/2                       | 10 1/2           | Management Assistance          | -                  | -                | - 3.45                |
| AMSE     | 41 5/8               | 35 3/4                       | 7 1/2            | National Equip. Rent.          | + 1 3/4            | + 4.90           | - 9.91                |
| AMSE     | 38                   | 46                           | 48 1/2           | Randolph Computer Corp.        | + 2 1/2            | + 5.43           | + 27.63               |
| AMSE     | 10 7/8               | 11 1/2                       | 13               | U.S. Leasing                   | + 1 1/2            | + 13.04          | + 19.54               |

\* Companies included in Computerworld's stock trading index for each sector.

### Wall Street's View

## New Highs Seen for CDC, GC Computer

**CONTROL DATA** — Both C.B. Richard, Ellis & Co. and Bache & Co. foresee a test of CDC's high of 165-5/8 in the near future. Bache recommends that traders should add to previously established positions, but warns that a close of below 135 should be considered a danger signal.

**G C COMPUTER** — Gude, Winnill & Co. think the company could be the "sleeper" in the computer leasing sector. The stock resisted downside pressures and seems poised for an attack upon its old high and could move into new, high ground should the market continue upward, G.W.&Co.'s analysts note.

**IBM** — Bache & Co.'s point and figure chart shows that enough backing and filling has occurred to support a move to the 680 zone over the intermediate term. Purcell, Graham & Co. notes that while IBM stock is quite volatile and can be vulnerable over any short period of time, it still merits investment consideration for a long range investor who makes use of a dollar-cost averaging program in buying

shares. Francis I. DuPont & Co. suggests the stock as a basic means of participating in the growth of the electronic data processing industry. The only significant element of risk which overhangs this high quality investment, according to DuPont, is possible antitrust action which could result from the current investigation of the computer industry by the Justice Department.

**SANDERS ASSOCIATES** — A move to the low 60 level from its present 47-1/2 is seen by both Bache & Co. and C.B. Richard Ellis & Co. Bache suggests that a move through 52, where resistance has developed previously, accompanied by increased volume, would foreshadow this rise.

**LEVIN-TOWNSEND COMPUTER** — According to Gude, Winnill & Co., LT management expects a 100% increase in earnings for the fiscal year ended March 1969 and at 12 times projected earnings, the stock does not seem overpriced and appears poised for a sharp move upward.



# Brokers Find Two New Ways to Sell Time

Two new ways of selling computer time have been initiated, one on the East Coast and one on the West Coast.

A New York firm, Time Brokers, Inc., is suggesting to its users that now that multiprogramming is available, it might be feasible to sell one or more parts of a multiprogramming system while keeping the rest for themselves. Sven Hartmann, president of Time Brokers, said that it seemed reasonable that if machines can run more than one program at a time, and if there is some spare capacity, it should be used

to increase the income of the installation.

"We have heard for a long time that this is technically possible," he told COMPUTERWORLD, "and now we expect to slowly find people willing to do it. There are probably some technical difficulties that are sometimes being glossed over, but let's put it into practice and find out."

## No Customers Yet

"We have one client who is very seriously studying it now. They are

some way out of town and have a very powerful system so that they would be able to give plenty of core availability to a user. As yet, however, we haven't any actually in operation."

Hartmann noted that many computers now have to be kept running because of various communications systems which must be kept in operation. But there is actually excess computer time available.

## Free Software

Over on the West Coast a firm has a different idea. Time Sharing Services, Inc., Beverly Hills, has produced software which they are allowing people to use free when they buy computer time from them.

The operations started last

November when Time Sharing obtained exclusive rights to the excess time on a 360/50 at Litton Industries. To sell time they offered the advantages of a special automatic testing procedure which was claimed to reduce test time by up to 50%, a very worthwhile advantage, one that could be realized by testing the software on the Litton computer.

The Automatic Testing Procedure Package consists of three programs - Dataset Generator, Dataset Printer, Dataset Stripper - designed to interface with and complement each other rather than satisfying one area of data processing at the expense of the other. As a unit, the three offer automatic, easy testing procedure.

## Test Records

The Dataset Generator (DSG) is written in assembly language and designed to be used within the framework of the System/360 Operating System. Proper utilization of this program apparently eliminates the long and tedious preparation of test file generation.

The Dataset Printer (DSP), is written in assembly language and designed for use within the framework of the operating system. Its primary function is to eliminate operator intervention and to expedite testing sessions. It can dump any or all files that a programmer may be concerned with.

## Selects Live Records

The Dataset Stripper (DSS) is also written in assembly language and designed for the System/360. Input is a tape or disk master file. Output can be punched in the format acceptable to the Dataset Generator. DSS can be used to select certain types of records from live data to then be used in a test session. Voluminous live files, with all the accompanying problems and long test sessions, will be eliminated.

## DPMA Chapter Meets

Dr. Marvin M. Wofsey will speak on "External Relations - Data Processing Manager and Customers" at the meeting of the Boston chapter, Data Processing Management Assoc., 7:30 pm, April 24, MIT Graduate House, Cambridge, Mass.

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### 360/20 Documentation Aid

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Price: Upon Request  
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### CLASS SCHEDULING

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COMPUTER AND MANAGEMENT SYSTEMS

## CW's Career Column

### Big Raises May Be Best Incentive For Analysts

Have you been feeling dissatisfied lately with your salary? If so, don't feel lonely — your thought is shared by millions of people.

According to Dr. Saul W. Gellerman, former manager of personnel research at IBM, it is virtually unnatural to feel otherwise. Gellerman reports in an article in the March issue of *Fortune* magazine that "it is a stubborn and extremely important fact of life that expectations of an increase in earnings tend to recur periodically, almost regardless of income level, effort, or accomplishment. Pay increases interrupt the cycle, but only temporarily. Many people, therefore, spend more time being dissatisfied with their incomes than being satisfied with them. Even people who are relatively well paid, in terms of objective indices, will spend a significant part of their careers in a state of relative dissatisfaction with their pay."

#### Raises Make the Difference

Interestingly, satisfaction with one's salary is not related to its absolute magnitude compared to the income of people doing comparable work, but rather with the rate and degree of change. Gellerman reports that "satisfaction from money results primarily from an increase in income." Thus, the fact that an employer may pay his employees quite well

relative to the outside labor market will not, as a rule, make his employees feel particularly grateful.

Most people experience ever increasing expectations in regard to their income. Gellerman believes that it is rare for employees to be surprised by the timing or the size of their pay increases. They may be disappointed, but they are seldom surprised. Psychologically, the raise is already incorporated into what the employee regards as his earning's base — it is not something extra. This does have at least one benefit. When a predictable income increase is seen in the future, it can motivate loyalty. (One can avoid the unpleasant necessity of looking around for another job by maintaining the belief that the expected increase will be satisfactory.)

#### Timing Is Important

However, if the pay increase does not occur on schedule, this will generate disappointment, and the feeling that the system is unjust, and perhaps, if the delay is prolonged, lead to a search for another job. Or the individual may be motivated to complain, not necessarily about money alone, but about all the petty annoyances which he is ordinarily willing to tolerate. Pay raises are in effect continually chasing the moving target of an employee's expectations.

To put it succinctly, Gellerman states that "most salary, bonus, and profit sharing plans do not motivate any action other than the purely passive one of staying with an organization."

Gellerman advises that an employer, if he is to use money as an effective motivator, must use pay increments large enough to have an appreciable effect on the employee's standard of living, or creature comforts. Unless the pay increment, when it does come, is princely, it is unlikely to excite the imagination of what the appetite.

#### Judging the Size

How does an employer judge the size of such an increase? It is difficult, Gellerman warns. What may appear to an employer to be a sizable increase may not be seen as such by the employee. "The importance of an increment is as much in the eye of the beholder as its monetary value," says Gellerman. The more wealthy a man is, the larger an increment must be used to impress him.

#### Raise Must Match Promotion

As a result, if a pay increment is not large enough, individuals might ask themselves whether it might not be wiser to decline a promotion to preserve an already high income at an acceptable risk level. But according to Gellerman, "Most people have a price."

Large pay increments are not appropriate in every situation however. The combination of men and jobs in which the use of large pay increments are appropriate is quite rare. Gellerman advises the employer that there is little point in paying a premium for performance that would probably be attempted without extra pay. The task must include risks, discomforts, and difficulties that would ordinarily preclude attempts to accomplish it. Creative work in such areas as product development, organizational analysis, and investment or acquisition analysis could, in the right circumstances, qualify for the larger increment treatment.

#### Large Increases for Some

Gellerman feels that such large increases should be used only with people who are susceptible to them, people who are capable of some singularly important contribution to the organization — something they would be unlikely to attempt unless they were unusually motivated.

Gellerman feels there are two types of people who can be motivated by such large pay increases.

One type is comprised of those able to lead the way into "breakthrough" areas that can change the whole mission or strategy of an organization. As an example, he cites Charles P. Steinmetz whose inventions at General Electric practically created a new industry.

While not referring specifically to data processing jobs, Gellerman seems to imply that the other type of person who might be a candidate for "princely pay" increments is one involved in such areas as computer systems design and analysis. Jobs of this kind properly demand courage — the consequences of a mistake can be so horrendous that an individual's reputation is at stake along with his security. It is clearly in the organization's interest to have decisions made solely on the basis of the capable man's judgments, undiminished by any fears of his own future. Thus an increment large enough to overcome his natural tendency to play it safe could be more than amply repaid by the results.

Gellerman closes by reminding employers that there are many ways besides pay raises of telling employees that you care about their welfare: working conditions (lighting, paint, music, air conditioning) and psychological conditions (more frequent communication between employer and employees, listening carefully to employee complaints, attempting to learn their needs, and frequent counseling on non-monetary matters.)

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# Computer Helps Find 'Dream House'



Using codes from a special form, a realtor "telephones" a central computer to get a list of all houses available that match the requirements set by a client.

FALLS CHURCH, VA. — A computer in Michigan that can "talk" over the telephone has begun helping home buyers in Virginia find the right house, at the right price, in the right location.

The Northern Virginia Board of Realtors has inaugurated a computerized home buyers service for its 164 member firms.

"It is the first computerized multiple listing service (MLS) in the East and only the second in the country outside the Detroit Area," board president Edward R. Briggs said.

Some 1600 realtors and their agents in Northern Virginia are consulting by phone with a computer in Detroit that carries details on some 3000 homes.

## Computer Talks Back

The computer is equipped with "voice answer back," enabling it to respond to a realtor in seconds, identifying homes that have the price range, the design, and other characteristics specified by a buyer. Realtors can use any push button telephone to feed a home buyer's requirements into the computer.

The key to this service, an IBM 7770 audio-response unit, is the vocal element which tells the salesman the information he requests.

The file contains information on thousands of homes, including style, price range, number of bedrooms, and location, and as many as 15 personal preference items such as family room, swimming pool, fireplace, and patio. It is updated daily as homes in Northern Virginia are added to or removed from the market, keeping a constant, accurate file of homes available.

Using a special code, any realtor who is a member of the MLS can call the computer and obtain information on homes that are available in any given neighborhood.

## Finding a Home

For example, a young couple with three children meet

with an MLS realtor to select the home they desire from a form listing various types of homes and their features. They select a colonial style home with four bedrooms, two baths, family room, garage, located in an area within one square mile west of the Pentagon, priced around \$28,000, and ready for immediate occupancy.

Following the codes on the form, the realtor taps out the codes to the computer. Within seconds, the computer tells him the code numbers of 11 homes meeting the client's specifications. He then locates the appropriate cards in his files which contain a photograph and additional information on the houses and makes an appointment to view the property selected by the couple.

"The greatest benefit of this system is that the home buyer spends less time investigating homes which do not meet his requirements. The service is more precise than previous methods in selecting homes desired by the customer," Briggs said.

## Selling a Home

"Another major benefit derived from the computer," Briggs added, "is we can use it to assist home sellers price their properties consistent with market conditions. The computer will quote comparable prices for the preceeding 12 months based on the area and similarities of homes sold."

An average of 3000 homes for sale in Alexandria, Arlington, and Fairfax counties are filed in the computer.

Realtron Corp., Detroit, which offers the computerized MLS, uses an IBM 1440 computer. They will switch to a larger and faster computer, an IBM System/360 Model 30, this month.

The audio response a salesman hears is actually a prerecorded male voice. Words and sounds are magnetically recorded on a drum, but rather than being played back in the sequence in which they were recorded, they are played back in the sequence directed by the computer.

## It's Called 'Spurt'

### Students' Simulation Language Teaches Structure

CHICAGO — Students at Northwestern University, Evanston, Ill., have developed a simulation language called Spurt simulation package for university research and development), according to the latest issue of the ACM Special Interest Committee on Digital Simulation (SICSIM) Newsletter.

Spurt, developed to teach the structure of simulation, consists of a set of Fortran subroutines and functions designed to facilitate the writing of computer simulations in Fortran. A clock subroutine is available for use with discrete time simulations, and there are subroutines to simulate analog components.

The program, written in Fortran, was developed on a CDC 3400 but now is also available for the CDC 6400, according to SICSIM member Benjamin Mittman at the university.

## Standards Needed

In the same newsletter, Jay T. Carrigan, technical manager at Applied Data Research, Arlington, Va., suggests that SICSIM pressure computer manufacturers to provide simulation models of their hardware and operating systems in a standard simulation language.

"This would be of invaluable assistance to someone involved in the design of complex systems," Carrigan said, "for models of the application could be 'plugged in' to the provided models and performance estimates would be readily obtainable."

### Systems Seminar Planned for May 24

SWAMPSCOTT, MASS. — David T. Kearns, an IBM vice president, will be the keynote speaker May 24 at the New England Systems Seminar here sponsored by the New England chapter, Systems and Procedures Association.

Among the topics scheduled for the all day session at the New Ocean House are effective documentation,

how to get the most out of a systems interview, breaking the input barrier, and the role of simulation in systems analysis.

The registration fee of \$30 includes lunch, cocktails, and a clambake. Additional information may be obtained from Marie T. Connolly, United Shoe Machinery Corp., P.O. Box 2377, Boston, Mass. 02107.

### Banking System Keeps Track of Household Budget



ALBUQUERQUE, N.M. — A new banking service being offered here won't balance the family budget for you — but it will tell you if the martini fund is overdrawn.

The automatic check budget (ABC) program offered by the American Bank of Commerce permits holders of regular checking accounts to divide their budgets into as many categories as they wish. At the end of each month, the bank's computer provides a summary report, including number of checks, total amount, monthly percentage, year to date total, and year to date percentage for each classification.

All the user does is write a classification number on each check and deposit slip. ABC does the rest, including letting the user know in which areas he is over his budget. It can also keep a running record of various income sources and of installment payments on mortgages, cars, and homes.

But unfortunately ABC, like a husband, can be outwitted by a wife who writes out unnumbered checks to "cash" and fails to write a classification code on them.

The system, believed to be one of only six in the country, was designed by Don Brady, treasurer of the New Mexico chapter of the Data Processing Management Association. Brady was recently promoted to assistant vice president of the bank and is responsible for all data processing there.

The April chapter meeting will be a field trip to the American Bank of Commerce and one other local bank, followed by dinner.

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